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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,891	07/28/2003	Genji Imai	029430-553	3805
21839	7590	02/22/2005	EXAMINER	
BURNS DOANE SWECKER & MATHIS L L P			HAMILTON, CYNTHIA	
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ALEXANDRIA, VA 22313-1404			PAPER NUMBER	

1752

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/627,891

Applicant(s)

IMAI ET AL.

Examiner

Cynthia Hamilton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09418368.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 24-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. It is not clear from the language of claims 24-30 whether an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated and when not irradiated. Further, it is not clear where support for said resist of claim 24-30 is found in the original specification because the only positive ultraviolet sensitive resist which have these properties is that which is made from the "said resist" of claims 24-30. The composition set forth is not that on page 35 of the instant specification which is the actual resist that has the properties of an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated. The heating step is set forth on page 35 of the instant specification to form a resist. In heating, the unsaturated ether group is consumed, as are some if not all of the carboxyl groups in the copolymer. It is this heating step that causes a resist to be formed that is insoluble in a solvent or aqueous

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alkali solution. Thus, what is being claimed as a “positive thermally sensitive resist” in claims 31-37 is confusing.

b. It is not clear from the language of claims 31-37 whether an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated. Further, it is not clear where support for said resist of claim 31-37 is found in the original specification because the only positive thermally sensitive resist which have these properties is that which is made from the “said resist” of claims 31-37. The composition set forth is not that on page 35 of the instant specification which is the actual resist that has the properties of an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated. The heating step is set forth on page 35 of the instant specification to form a resist. In heating, the unsaturated ether group is consumed, as are some if not all of the carboxyl groups in the copolymer. It is this heating step that causes a resist to be formed that is insoluble in a solvent or aqueous alkali solution. Thus, what is being claimed as a “positive thermally sensitive resist” in claims 31-37 is confusing.

c. The same problem is present in claims 38-44 with respect to “the positive visible-light sensitive resist” and the “said resist comprising”. Thus, what is being claimed in claims 31-44 is unclear.

The portion of page 35 cited is as follows:

10 When a film formed from the composition of this
invention is heated, a carboxyl group and an unsaturated
ether group in the copolymer form a crosslink via addition
reaction, to make the film insoluble to a solvent or
aqueous alkali solution. Subsequently, by irradiating it
15 with an active energy beam and then heating it, an acid
is generated, which acts as a catalyst to cleave the
crosslink structure. Thus, the exposed part again
becomes soluble to a solvent or aqueous alkali solution.

Thus, the issue remains for the resists of claims 24-44 as to whether the “whose part irradiated with” ultraviolet for claims 24-30, heat rays for claims 31-37 or visible-sensitive for claims 31-44 “is soluble or dispersible in an organic solvent or an aqueous developing solution and whose unirradiated part is substantially insoluble and undispersible in an organic solvent or an aqueous developing solution” refers to a crosslinked product of “said resist comprising a base polymer, an ether-bond-containing olefinic unsaturated compound and an acid-generating agent...” as found in instant claims 24-37 or to the composition before such crosslinking occurs. The passage on page 35 makes clear that it is the crosslinked product of a copolymer and an unsaturated ether that makes the film used for imaging insoluble in a solvent or aqueous alkali solution. This crosslinked film has the property of becoming soluble to a solvent or aqueous alkali solution after it has been exposed to ultraviolet rays, heat rays or visible-sensitive rays. The claim language still does not make clear if the resist claimed has been irradiated or not and it is not at all clear if the combining of the base polymer, the ether-bond-containing olefinic unsaturated compound and an acid-generating agent would yield without heating a crosslinked structure

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having the properties set forth. Thus, the rejection with respect to clarity of claims 24-44 is repeated.

2. Applicant's arguments filed December 6, 2004 have been fully considered but they are not persuasive.

Applicants argue the Examiner did not use the appropriate standard for determining compliance with the second paragraph of 35 USC 112, second paragraph. Applicants argue the standard is "whether the claims reasonably apprise those of ordinary skill in the art of their scope." In re Warmerdam is cited to support this argument. Applicants state "In determining whether this standard is met, the definiteness of the language employed in the claim should be analyzed, not in a vacuum, but in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. Applicants then cite In re Johnson.

With respect to In re Warmerdam, this case is drawn to a machine and has arguments with respect to a claim for a machine that incorporates process steps which is held not to need to conform to conventional definitions of product-by-process claim. The point in In re Warmerdam (which the examiner notes is 31 USPQ2d 1754 (CAFC)) is that any machine having a memory containing data representing a bubble hierarchy is within the scope of claim 5 in the application at issue. The examiner is not sure what applicants are arguing here. The examiner is not sure what applicants are claiming. Are they claiming a photoresist having the properties? Are they claiming an imaged photoresist? Are they claiming the mixture of components that can by any manipulation be seen to obtain the properties as set forth? It is not clear what applicants point is here. Does the photoresist have the properties? The machine of In re Wamerdam is any machine

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that has the memory containing data represented by a bubble hierarchy. This clarity does not exist for the claims now in question. The examiner does not believe the wording set forth in the instant claims makes clear whether the photoresist is comprised of irradiated and unirradiated parts or is limited to such a photoresist that when irradiated would have such properties and when unirradiated would have such properties. Because of the confusion of to what the properties of solubility pertain, the examiner cannot determine what is being claimed. She believes that the passage on page 35 supports her reasons for confusion as to the actual limits of the photoresist claimed. Is the photoresist the uncrosslinked composition that when crosslinked will have the property limits set forth? Is the photoresist the crosslinked film made from the components set forth that has the ability when irradiated to have the properties set forth and when left unirradiated would have the properties set forth? Is the photoresist the imaged product with irradiated portions and unirradiated portions with the properties set forth? This is what is not clear from the claim language. The examiner believes a worker of ordinary skill in the art would also not be sure which is being claimed in view of the need to crosslink the components to form a film which would have the ability to be imaged in the manner set forth. Thus, there are three separate elements possibly being claimed.

- i. The composition called a photoresist before any crosslinking has occurred. This composition is not insoluble, nor would it become soluble as required as the composition.
- ii. The crosslinked film of page 35 that has not been imaged but would be insoluble as required and upon irradiation would be soluble as required.

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iii. The imaged film, which is the crosslinked product of the heated composition set forth, with crosslinked portions that are insoluble and irradiated portions wherein the crosslinks have been broken having the properties set forth.

Without clarity as to what is encompassed by the claim language the worker of ordinary skill in the art cannot determine the scope of what is being claimed.

As to In re Johnson as cited by applicants, the examiner has pointed to one part of the instant specification which does not have “may” in referencing the issue of heating and formation of an image with the disclosed invention. Applicants, in their arguments, point to less definite passages. However, the passage at page 35 is clear as to how the disclosed invention works. The rejection stands.

3. With respect to rejections under 35 U.S.C. 103(a) as being unpatentable over Imai et al (5,496,678) in view of Kondo et al (5,363,738), Yamachika et al (5,556,734) and Hanabata et al (4,696,886), applicants have made of record the 37 CFR 1.132 declaration of the Parent application. The declaration signed November 15, 2002 by Genji Imai makes a clear showing that the use of 4-(1-methylethenyl)phenol over p-hydroxystyrene yields an unexpectedly superior effect with respect to resolution, transparency and thermal stability. The difference of one methyl group is unexpected over the prior art. Thus, whichever of the three elements is being claimed by applicants, the properties exhibited by the final product are unexpected and clearly in view of this Declaration evidenced to be because of the exchange of one methyl group in the backbone for a hydrogen. Thus, issues with respect to Imai et al (5,496,678) in view of Kondo et al (5,363,738), Yamachika et al (5,556,734) and Hanabata et al (4,696,886) are removed.

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4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331. The examiner can normally be reached on Monday through Friday 9:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H Kelly can be reached on (571) 272-0729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**CYNTHIA HAMILTON
PRIMARY EXAMINER**

Cynthia Hamilton
Primary Examiner
Art Unit 1752

February 20, 2005